U. S. FOREST SERVICE

RESEARCH NOTE LS-52

LAKE STATES FOREST EXPERIMENT STATION • U. S. DEPARTMENT OF AGRICULTURE

Primary Wood Use by Manufacturing Firms in Duluth-Superior, 1962

The urban area of Duluth, Minn., and Superior, Wis., commonly called the Twin Ports and containing about 145,000 persons, has important manufacturing and shipping industries. Some of these industries use substantial volumes of primary[1] forest products in their operations.

Many of the surrounding counties have large timber surpluses in certain species — that is, the harvest desirable on a sustained yield basis is much greater than the current actual cut. To find out if the use of local woods could be increased, a study was made of primary wood use by manufacturing companies in Duluth-Superior during 1962. The study was part of a comprehensive economic appraisal of expansion possibilities for forest products industries in northeastern Minnesota.

Twenty-six manufacturers (all of those using significant amounts of the products) were interviewed. Results showed that in 1962 manufacturing firms in the Twin Ports used more than 1.5 million board feet of lumber, almost 400,000 square feet of plywood, and more than 500,000 square feet of hardboard and particleboard. No data were collected on wood used for repair and maintenance and secondary fabricated wood products purchased by industry.

Of the lumber used, at least one-fourth was Minnesota-grown, one-fifth or more came from Wisconsin and Michigan forests, and the remainder was primarily of western origin. Half of the lumber was procured from sawmills, with Minnesota mills supplying almost half of these direct purchases (fig. 1). Wholesalers and brokers furnished about two-fifths of the total, and Twin Ports retailers supplied the rest.

About three-fifths of the industrial lumber in 1962 was used in making salable products; all other lumber requirements were for shipping or warehousing purposes (table 1). The most common products included millwork; cabinets and fixtures; crating and boxes; and blocking, bracing, and dunnage. The most frequently used species were ponderosa pine and sugar pine for millwork; white birch, yellow birch, and white oak for cabinets and fixtures; and eastern white pine and aspen for crating and boxes.

Nearly all (84 percent) of the lumber was purchased by grade. Two-thirds of all softwood and one-half of all hardwood lumber was No. 1 common and better (table 2). For those manufacturers uncertain of the grades they bought, the grades were estimated from the buyer's specifications and requirements. White birch, eastern white pine, and aspen lumber were predominantly low-grade material. Oak was a mixture of high and low grades. Western species were essentially high-grade lumber.

Fifty-two percent of the lumber was kiln dried and another 37 percent was air dried (table 3). The only species used green were aspen, eastern white pine, and white birch employed in shipping and warehousing. Rough lumber accounted for

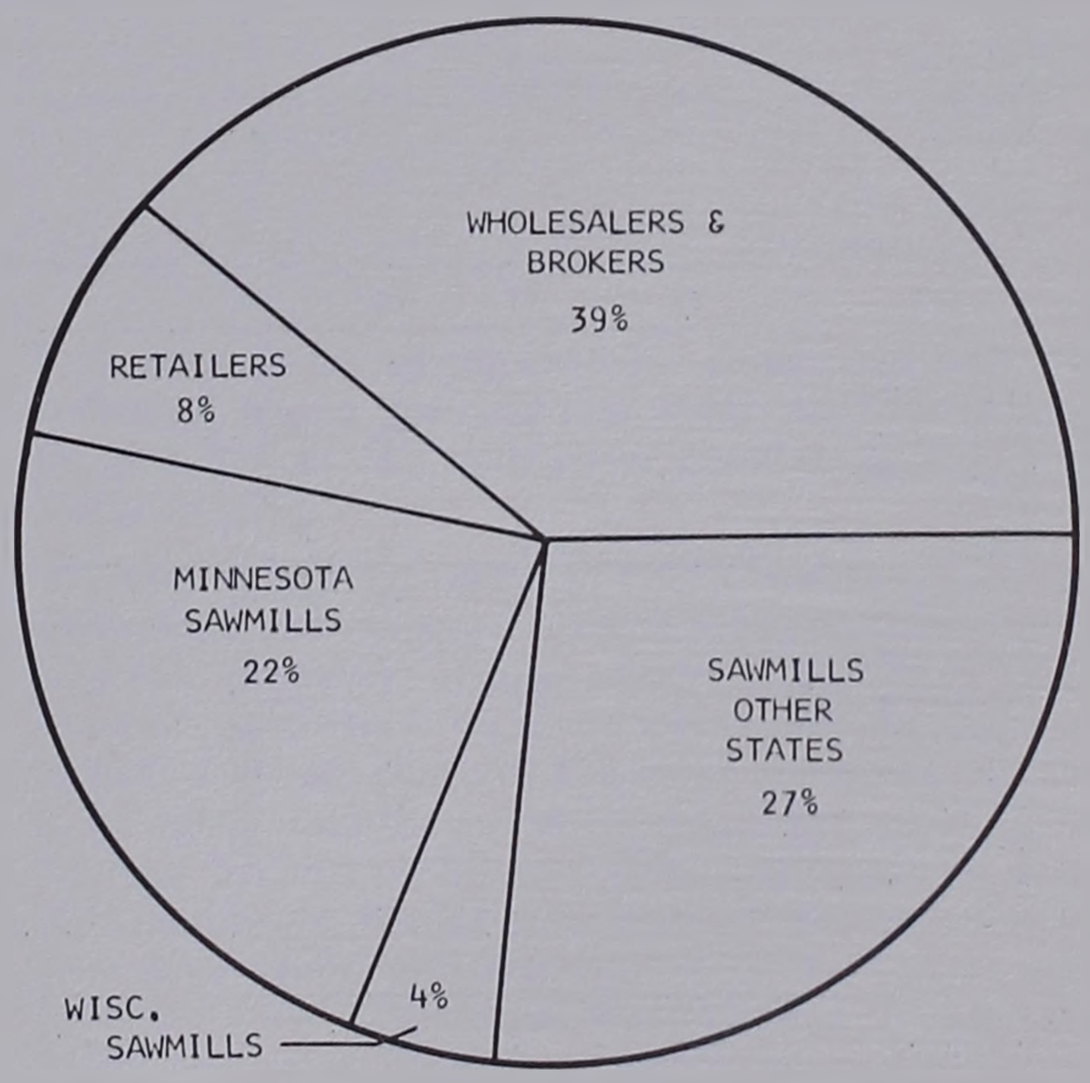

FIGURE 1. — Source of supply of industrial lumber, Duluth-Superior, 1962.

[1] *"Primary" forest products as used here include lumber, veneer, plywood, and composition boards.*

Table 1.--Lumber use in manufacturing and shipping, by product and species, in Duluth-Superior, 1962

(Thousand bd. ft.)

Species	Product							Shipping			
	Millwork	Cabinets and fixtures	Flooring	Patterns	Signs	Other	Product total	Crating & boxes	Blocking, bracing, & dunnage	Skids & pallets	Shipping total
Hardwoods											
Birch	55	120	-	-	-	*	175	-	33	-	33
Aspen	-	-	-	-	-	-	-	88	24	36	148
Oak	40	56	16	*	-	*	112	-	15	-	15
Basswood	10	20	-	6	-	-	36	-	-	-	-
Maple	-	10	8	-	-	10	28	-	6	-	6
Walnut	1	20	-	-	-	-	21	-	-	-	-
Ash	-	20	-	-	-	-	20	-	-	-	-
Cherry	-	1	-	-	-	-	1	-	-	-	-
Mixed hardwood	-	-	-	-	-	2	2	-	-	-	-
Northern softwoods											
White pine	-	-	-	-	-	-	-	186	8	-	194
Jack pine	-	-	-	-	-	-	-	20	-	-	20
Mixed pine	-	-	-	-	-	-	-	1	15	-	16
Cedar	10	-	-	-	-	-	10	-	-	-	-
Spruce	-	-	-	*	-	-	*	-	-	6	6
Western softwoods											
Ponderosa pine	300	-	-	-	-	5	305	25	-	-	25
Sugar pine	110	-	-	11	-	1	122	-	-	-	-
Douglas-fir	15	-	-	-	10	18	43	7	60	3	70
Redwood	46	-	-	-	-	-	46	-	-	-	-
White fir	30	-	-	*	-	-	30	-	-	3	3
Sitka spruce	-	-	-	-	-	-	-	-	30	-	30
White pine	*	-	-	2	10	-	12	-	-	-	-
Imports											
Mahogany	31	1	-	-	-	-	32	-	-	-	-
Obeechie	-	-	-	4	-	-	4	-	-	-	-
Total	648	248	24	23	20	36	999	327	191	48	566
Percent	41	16	2	2	1	2	64	21	12	3	36

*Less than 500 board feet.

Table 2.--Lumber use in manufacturing and shipping by species and grade in Duluth-Superior, 1962

(Thousand bd. ft.)

Species	Firsts & seconds	Finish & 1/ selects	No. 1 common	No. 1 common & better	No. 2 common	No. 2 common & better	No. 3 common	No. 3 common & better	No. 4 common	Mill-run 2/	No. 5 common	Structural	Total	Percent of all species
Hardwoods														
Birch	6	69	-	-	-	-	18	100	-	15	-	-	208	13.3
Aspen	-	-	40	-	-	-	53	-	20	35	-	-	148	9.5
Oak	37	16	9	10	-	*	5	40	-	*	-	10	127	8.1
Basswood	-	-	16	-	-	20	-	-	-	-	-	-	36	2.3
Maple	8	10	-	10	-	-	6	-	-	-	-	-	34	2.2
Walnut	*	1	-	20	-	-	-	-	-	-	-	-	21	1.3
Ash	-	-	-	20	-	-	-	-	-	-	-	-	20	1.3
Cherry	-	1	-	-	-	-	-	-	-	-	-	-	1	.1
Mixed hardwood	-	-	-	-	-	-	-	-	-	2	-	-	2	.1
Total	51	97	65	60	-	20	82	140	20	52	-	10	597	38.2
Northern softwoods														
White pine	-	-	-	-	8	-	6	-	-	180	-	-	194	12.4
Jack pine	-	-	20	-	-	-	-	-	-	-	-	-	20	1.3
Mixed pine	-	-	-	-	-	-	1	-	-	-	15	-	16	1.0
Cedar	-	-	-	10	-	-	-	-	-	-	-	-	10	.6
Spruce	-	6	-	-	-	*	-	-	-	-	-	-	6	.4
Total	-	6	20	10	8	*	7	-	-	180	15	-	246	15.7
Western softwoods														
Ponderosa pine	-	60	-	240	5	-	-	-	-	25	-	-	330	21.1
Sugar pine	-	32	-	90	-	-	-	-	-	-	-	-	122	7.8
Douglas-fir	-	1	15	28	2	7	-	-	-	-	-	60	113	7.2
Redwood	-	1	45	-	-	-	-	-	-	-	-	-	46	2.9
White fir	-	-	-	33	-	-	-	-	-	-	-	-	33	2.1
Sitka spruce	-	-	30	-	-	-	-	-	-	-	-	-	30	1.9
White pine	-	*	2	-	10	-	-	-	-	-	-	-	12	.8
Total	-	94	92	391	17	7	-	-	-	25	-	60	686	43.8
Imports														
Mahogany	31	1	-	-	-	-	-	-	-	-	-	-	32	2.0
Obeechie	-	4	-	-	-	-	-	-	-	-	-	-	4	.3

1/ Hardwood select and softwood finish grades.
2/ Includes No. 4 and better hardwood.
* Less than 500 board feet.

Table 3.--Surface and moisture condition of industrial lumber used in Duluth-Superior, 1962

(Thousand bd. ft.)

Species	Rough green	Rough air dry	Rough kiln dry	Finish green	Finish air dry	Finish kiln dry	Total
Hardwoods							
Birch	15	118	15	-	-	60	208
Aspen	50	68	-	2	28	-	148
Oak	-	65	17	-	-	45	127
Basswood	-	20	16	-	-	-	36
Maple	-	16	18	-	-	-	34
Walnut	-	-	20	-	-	1	21
Ash	-	20	-	-	-	-	20
Cherry	-	-	-	-	1	-	1
Mixed hardwood	-	-	-	-	-	2	2
Northern softwoods							
White pine	-	94	-	100	-	-	194
Jack pine	-	20	-	-	-	-	20
Mixed pine	-	16	-	-	-	-	16
Cedar	-	-	10	-	-	-	10
Spruce	-	6	-	-	-	*	6
Western softwoods							
Ponderosa pine	-	-	240	-	5	85	330
Sugar pine	-	-	100	-	-	22	122
Douglas-fir	-	64	15	-	2	32	113
Redwood	-	-	45	-	-	1	46
White fir	-	2	30	-	-	1	33
Sitka spruce	-	30	-	-	-	-	30
White pine	-	-	1	-	-	11	12
Total	65	539	527	102	36	260	1/ 1,529
Percent	4	35	35	7	2	17	100

1/ Total does not include imports.
* Less than 500 board feet.

three-fourths of the 1962 consumption. Most of the finished lumber was kiln dried.

Except for three companies, the kinds of lumber bought and the procurement sources were determined by people in management positions or in business offices. In the other three firms, a foreman in the production department decided on the types of lumber needed, but purchasing agents determined the procurement source. Generally, the purchaser was familiar with the production processes of his company, and in the smaller firms he was usually closely associated with the production department.

The overall trend in industrial lumber consumption during 1958-62 was upward. During this 5-year period 11 firms noted an increasing use of lumber, 11 had no significant use changes, 1 firm had mixed trends which varied by species, and 3 companies had decreasing requirements. Companies with increasing needs for lumber from 1958-62 utilized 60 percent of the industrial lumber in the Twin Ports in 1962.

Approximately one-half of the lumber used was grown in the Lake States. Users commented on several obstacles which they felt Lake States lumber producers need to overcome if they are to gain a larger share of the local industrial market. Most often mentioned were: improper sawing and drying; undependable supplies; difficulty in locating the higher grades and large or odd dimensions; excessive costs; and inadequate promotion of local species. Two firms had discontinued using local white pine, one because of excessive shake and the other because of splintering. In addition, one of these concerns had abandoned the use of local white birch because birch could be obtained only

in 8-foot lengths. Three other companies were not using Lake States-produced lumber because of excessive shake in white pine, a shortage of kiln-dried stock, and relatively high prices.

The opportunities appear limited, under current conditions of manufacture, for Lake States lumber to displace western species that fulfilled more than two-fifths of the Twin Ports industrial lumber requirements in 1962. Most of the western lumber was kiln dried No. 1 common and better. The major western species and their uses were ponderosa pine and sugar pine for high-grade millwork and Douglas-fir and Sitka spruce for blocking and bracing. High-quality white pine is a logical substitute for the ponderosa and sugar pines, but high-grade white pine stumpage in the Lake States is relatively scarce and in scattered stands. Furthermore, most sawmills have no dry kiln facilities, a necessity for suppliers to the millwork trade. Consequently, millwork manufacturers have been paying premium prices for kiln-dried western pines. Perhaps native white pine lumber could be economically upgraded by edge- or end-gluing small clear pieces together for use in millwork.

Douglas-fir and Sitka spruce were used mainly for blocking and bracing material that required large thicknesses, long lengths, and high strength properties. These requirements could not be met by material cut from small-size Lake States trees. However, lamination, end gluing, and edge gluing might provide the strength and dimensions needed for the special uses. With proper engineering of products, red pine and tamarack might become suitable substitutes for the western species in some uses.

A more immediately promising use for local species is in fabricated boxes and crates. Several firms used assembled boxes and crates made in the South or Midwest. Since this study did not examine fabricated products, the box market potential for native lumber is unknown but appears to be significant. Aspen and white pine are excellent for this purpose.

Plywood was consumed in making signs, cabinets, fixtures, crating, patterns, and truck floors. Of 393,000 square feet used in 1962, 229,000 was Douglas-fir. Hardboard and particleboard were used for items such as signs, displays, patterns, cabinets, and counter tops. During 1958-62 the industrial use trend for plywood, hardboard, and particleboard was upward in Duluth-Superior.

On the whole, the future demand for Lake States timber for industrial purposes in Duluth-Superior seems reasonably good. Use is expanding, approximately one-half of the industrial lumber comes from timber grown in the Lake States, and opportunities probably exist for local fabricators, using native lumber, to supply a larger share of the assembled wooden containers to industrial customers.

Recent Lake States Forest Survey statistics show that sawtimber volume and quality is increasing. With improved manufacturing technology, opportunities should increase for sawmills to produce a more acceptable quality of lumber.

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